

A METHOD OF IMPROVING THE EFFICACY OF LACTIC ACID BACTERIAL  
STARTER CULTURES AND IMPROVED STARTER CULTURE COMPOSITIONS

ABSTRACT

Methods of enhancing the growth rate and/or controlling the  
5 metabolic activity of lactic acid bacteria and of improving the  
shelf life and/or the quality of an edible product using lactic  
acid bacterial organisms which are defective in their pyruvate  
metabolism. There is also provided starter culture compositions  
comprising such defective lactic acid bacteria as helper  
10 organisms and lactic acid bacterial starter culture strains.  
Useful helper organisms are *Lactococcus* strains which are  
defective with respect to pyruvate formate lyase (Pfl) and/or  
lactate dehydrogenase (Ldh) activity. The helper organisms may  
overexpress a gene coding for an NAD<sup>+</sup> regenerating enzyme such  
15 as NADH oxidase encoded by *nox* gene.